

**Host Plants, Behavior, and Distribution of the Eucerine
Bees *Idiomelissodes duplocincta* (Cockerell) and
Syntrichalonia exquisita (Cresson)**

(Hymenoptera: Anthophoridae)

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The monotypic eucerine bee genera *Idiomelissodes* and *Syntrichalonia* are limited to the arid portions of southwestern United States and northern Mexico. According to LaBerge (1957), *Idiomelissodes* is related to the more widespread genera *Svastra* and *Anthedonia*, and *Syntrichalonia* is perhaps related to the widespread genus *Synhalonia* (as *Tetralonia*). The species of *Idiomelissodes* and *Syntrichalonia*, *duplocincta* (Cockerell) and *exquisita* (Cresson), respectively, have been collected rarely, and very little is known about their flower preferences or behavior. The purposes of the present paper are to briefly summarize my observations on the host plants and behavior of these bees, and to extend their known distributions.

Most specimens reported here are in the collection of the California Academy of Sciences or in my private collection. Other specimens reported are in the following collections: Arizona State University; Instituto de Biología, Universidad Nacional Autónoma, Mexico City; Natural History Museum of Los Angeles County; United States National Museum of Natural History; and University of California at Berkeley. I thank F. F. Hasbrouck, P. D. Hurd, Jr., E. G. Linsley, and R. R. Snelling for permission to examine the specimens in their care, E. G. Linsley and R. R. Snelling for criticizing the manuscript, and Roxi Berlin for typing the manuscript and preparing the tables.

IDIOMELISSODES DUPLOCINCTA (COCKERELL)

In southeastern Arizona and southwestern New Mexico, *duplocincta* occurs in the Sonoran and Chihuahuan deserts, where females gather pollen from flowers of barrel cactus, *Ferocactus wislizenii* (Engelm.) Britt. & Rose, throughout the hottest part of the day in the late summer. Both sexes of *duplocincta* visit other flowers for nectar, and in southwestern New Mexico I have collected specimens at the flowers of the following additional plants: *Cevallia sinuata* Lag. (Loasaceae), *Hoffmannseggia densiflora* Benth. (Leguminosae), and *Lippia wrightii*

Table 1. Diurnal activity of *Idiomelissodes duplocincta* on *Ferocactus wislizenii*, Rock Hound State Park, Luna County, New Mexico, on several dates in 1973 and 1974. Time periods are in Mountain Standard Time. Time periods during which no collecting was done are marked "NC."

Dates	Time periods											
	0900-1000		1000-1100		1100-1200		1200-1300		1300-1400		1400-1500	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
16 Aug. 1973	NC		1		4	1	1	14	1	7	2	NC
17 Aug. 1973				7	2	3	NC		NC		3	2
25 Aug. 1973	6		3	11		13	2	20		11	1	7
26 Aug. 1973	2			11		14	2	14	2	14		5
28 Aug. 1974						1		4		8		5
29 Aug. 1974				1		3		15		4		3
Totals	8		4	30	6	35	5	67	3	44	6	10

1

NC

1

NC

NC

NC

NC

Gray (Verbenaceae). Males from Baja California Sur that I have examined were collected at the flowers of *Asclepias* sp. (Asclepiadaceae), *Melochia tomentosa* L. (Sterculiaceae), and *Wislizenia refracta* Engelm. var. *mamillata* (Rose) Wiggins (Capparidaceae).

At Rock Hound State Park in southwestern New Mexico, *duplocincta* started arriving at *Ferocactus wislizenii* at 0900–1015 Mountain Standard Time (MST) on several mornings in 1973, and at 1045–1145 MST on two mornings in 1974, and continued to forage until 1500–1615 MST in the afternoon (Table 1). The air temperature varied from 24–31° C during my observations of the bees in 1974; the temperature was not recorded in 1973, but it was much higher, and this may account for the earlier arrival of the bees at the barrel cacti that year. At a site near Continental in southeastern Arizona, *duplocincta* was active on *Ferocactus wislizenii* from 1000–1015 MST until 1600 MST in both 1973 and 1974 (Table 2). At both localities, the daily foraging period of *duplocincta* appears to be well synchronized with the presentation of pollen by the barrel cacti. Individual flowers of these plants last three days. On the second and third mornings of their existence, the flowers open from 0830–0930 MST in bright sunlight, and pollen is available immediately. On all three afternoons, the flowers close from 1500–1700 MST in bright sunlight.

Females of *duplocincta* may approach a barrel cactus and fly directly into a flower, or they may approach and hover at a height of about 10–30 centimeters over the plant for several seconds before either landing or flying away. During this hovering, a female may drop to within a few centimeters of a flower, or strike it, or even alight on it momentarily, and then rise again one or more times. Once a female has settled on a flower, it crawls into the space between the style and innermost stamens and disappears from sight while it gathers pollen; after gathering pollen, it backs from this space and flies from the flower. At this time, it may again hover over the cactus for several seconds before departing or re-entering the same flower. Males of *duplocincta* fly rapidly around the barrel cacti, and sometimes hover over them, but they rarely land in the flowers. At Rock Hound State Park in 1973, they were frequently seen perching on twigs of mesquite, *Prosopis glandulosa* Torr. var. *torreyana* (L. Benson) M. C. Jtn., that extended over or near barrel cactus plants, and a single mating pair of *duplocincta* was observed on such a twig. The foraging activity of females and the patrolling activity of males are greatly reduced when the sun is obscured by clouds. Both sexes of *duplocincta* produce a char-

Table 2. Diurnal activity of *Idiomelissodes duplocincta* on *Ferocactus wislizenii*, 3.1-4.2 miles southeast of Continental, Pima County, Arizona, on two dates in 1973 and 1974. Time periods are in Mountain Standard Time.

Dates	Time periods											
	0900-1000		1000-1100		1100-1200		1200-1300		1300-1400		1400-1500	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
31 Aug. 1973			3		2	4			6	2	8	4
21 Aug. 1974			2		2	2			1		1	3
Totals			5		4	6			7	2	9	7

acteristic odor, similar to that of species of *Svastra* (*Epimelissodes*), which, depending upon its strength, may be pleasant or unpleasant.

The seasonal flight period of *duplocincta* is known to extend from June 15 (LaBerge, 1956:1031) to 6 October; all my collections of this species have been made in August.

The distribution of *duplocincta* is summarized by LaBerge (1956:1031), who records the species from Arizona, California, Chihuahua, and Coahuila. The species is recorded below for the first time from New Mexico and Baja California Sur.

Since *duplocincta* occurs in areas west of the range of *Ferocactus wislizenii* and sometimes flies in the early summer, before this cactus blooms, it obviously cannot be an oligolege of this species. However, since *duplocincta* is such a close and constant associate of this plant in southeastern Arizona and southwestern New Mexico, it probably is an oligolege of the genus *Ferocactus*, or, at least, of the family Cactaceae.

Specimens examined: 67 males, 264 females, from: UNITED STATES. *Arizona*: Continental (3.1–4.2 mi. SE); Graham Mts. (Stockton Pass); Mesa; Sahuarita (1.9 mi. SW); Sentinel; Tucson (16–18 mi. S). *New Mexico*: Deming (7.0 mi. ESE); Rock Hound State Park. *MEXICO. Baja California Sur*: La Paz (7 mi. SW, 24 mi. W, 10 mi. NW); Penjamo (22 mi. NW); Santa Rita (31 mi. S).

SYNTRICHALONIA EXQUISITA (CRESSON)

In southeastern Arizona, *exquisita* occurs most commonly in montane, forested regions, where it visits the flower heads of several species of Compositae for both nectar and pollen during the warmest part of the day in the late summer and early fall. All my records of this species are from composites with large, showy, yellow, radiate heads in the related, predominantly American tribes Helenieae and Heliantheae, namely: *Helenium hoopesii* Gray, *Helianthus annuus* L., *Heliopsis parvifolia* Gray, *Verbesina encelioides* (Cav.) Benth. & Hook., and *Viguiera dentata* (Cav.) Spreng. Other specimens of *exquisita* that I have examined were collected on *Asclepias* sp. (Asclepiadaceae), *Chrysopsis* sp. (Compositae, Astereae), *Encelia* sp. (Compositae, Heliantheae), *Helianthus annuus*, and *Verbesina oreophila* Woot. & Standl.

At Rucker Canyon, Chiricahua Mountains, in 1974, *exquisita* was active between 0930 and 1615 MST (Table 3). The air temperature in the upper, narrow part of the canyon, where *exquisita* visited flowers of *Viguiera dentata*, varied from 20–24° C during this time interval; the air temperature in the lower, broad part of the canyon, where it visited *Verbesina encelioides*, was 27° C at the time specimens were collected in the afternoon. At Rodeo, New Mexico, a male *exquisita* was collected

Table 3. Diurnal activity of *Syntrichalonia exquisita* on *Viguiera dentata* and *Verbesina encelioides*, Rucker Canyon, Chiricahua Mountains, Cochise County, Arizona, on several dates in 1974. Time periods are in Mountain Standard Time. Time periods during which no collecting was done are marked "NC."

Dates	Time periods																							
	0900- 1000		1000- 1100		1100- 1200		1200- 1300		1300- 1400		1400- 1500		1500- 1600		1600- 1700									
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀								
31 Aug. 1974	NC		NC		NC		NC		NC		NC		NC		3	1	NC							
5 Sept. 1974	1		8	1	2		NC		NC		2	1	1	2	1		1							
6 Sept. 1974		1		1	5	1	6	1	3	1	2	1	2		2		NC							
7 Sept. 1974	7	6		NC		NC		NC		NC		NC		NC		NC		NC						
Totals	8	7	8	2	7	1	6	1	3	1	4	2	6	3			1							

from *Helianthus annuus* by E. G. and J. M. Linsley between 1630 and 1659 MST when the temperature was 34° C.

Females of *exquisita* alight on the disks of the composite heads and gather the fine pollen grains characteristic of these plants in their dense, highly plumose scopal hairs. Males fly rapidly around and over the flower-bearing plants and alight occasionally to drink nectar. The foraging of females and the patrolling of males continue, but at reduced levels, when the sun is obscured by clouds for either short or long intervals.

The seasonal flight period of *exquisita* in southwestern United States is during and after the summer rainy season. The earliest and latest collection dates are 10 August and 4 October, and the greatest number of specimens has been collected in September. The seasonal flight period in Mexico is known to extend from 27 July to December.

Syntrichalonia exquisita has been previously reported only from Mexico (Cresson, 1878) and New Mexico (Cockerell, 1905). In the following list, it is recorded for the first time from Arizona and Texas in the United States, and Distrito Federal, Durango, Jalisco, and Zacatecas in Mexico.

Specimens examined: 61 males, 29 females, from: UNITED STATES. *Arizona*: Chiricahua Mts. (Barfoot Camp, Cave Creek Canyon, Rucker Canyon, Rustler Park); Huachuca Mts. (Miller Canyon, Yaqui Canyon Area); Mt. Graham; Patagonia (2.0 mi. SW); Santa Rita Mts. (Madera Canyon). *New Mexico*: Rodeo; Three Rivers (2 mi. S). *Texas*: The Basin, Big Bend National Park; Van Horn Mts. MEXICO. *Distrito Federal*: Pedregal de San Angel. *Durango*: Nombre de Dios. *Jalisco*: Mt. Colima (SE slope); San Juan Lagos. *Zacatecas*: Sombrerete (15 km. E).

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